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Docket Report on Health-Based Levels and Solubilities Used in the Evaluation of Delisting Petitions, Submitted Under 40 CFR §260.20 and §260.22

July 1992

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EPA Contract No. 68-W9-0091

The Delisting Section, in its review of delisting petitions, evaluates levels of carcinogens and systemic toxicants listed in Appendices VII and VIII of 40 CFR §261 and Appendix IX of 40 CFR §264. The exposure assumption that is used to assess the hazard of a petitioned waste is ingestion of contaminated ground water, leachate, or wastewater. For both carcinogens and systemic toxicants, the water intake assumption is 2 liters per day for an average 70 kg adult over a 70-year lifetime. The use of a 70-year lifetime considers the effects of carcinogens as a function of cumulative doses, rather than doses received by any small subsection of the population. In cases where constituents are known to be both carcinogens and systemic toxicants, the more conservative carcinogenic slope factor takes precedence over the verified or unverified toxicant reference dose.

The following equation is used to calculate the delisting health-based levels for carcinogens:

$$D_c = \frac{(R \times W \times LT)}{(CSF \times I \times A \times ED)}$$

where:

D_c = delisting health-based level for carcinogen (mg/l)

R = assumed risk level = 10^{-6}

W = body weight = 70 kg

LT = assumed lifetime = 70 years

CSF = carcinogenic slope factor = experimental potency $(mg/kg/day)^{-1}$

I = intake assumption = 2 L/day

A = absorption factor = 1

ED = exposure duration = 70 years

The following equation is used to calculate the delisting health-based levels for systemic toxicants:

$$D_s = \frac{(RfD \times W)}{(I \times A)}$$

where: D_s = delisting health-based level for systemic toxicant (mg/l)

RfD = reference dose (mg/kg/day)

W = body weight = 70 kg

I = intake assumption = 2 L/day

A = absorption factor = 1

Constituents which have verified health-based levels are listed on the EPA's Integrated Risk Information System (IRIS), which is maintained by the Office of Health and Environmental Assessment in the Office of Research and Development. The information listed on IRIS is designed to be a guide for the evaluation of potential health problems, and is included on IRIS only after an intra-office work group of EPA toxicologists and other scientists have reviewed the facts. IRIS provides verified information for oral and/or inhalation reference doses, risk estimates for carcinogenicity, drinking water health advisories, risk management summaries, and other supplemental data. (IRIS provides the carcinogenic slope factors and the reference doses that are needed in the previous equations.) IRIS is currently available on the National Library of Medicine's TOXNET system. The general public can access TOXNET through the NLM directly, TYMNET, SPRINTNET, COMPUSERVE or NLM/TYMNET. Hard copies of IRIS information for all constituents with verified delisting health-based levels will be provided by the Delisting Section upon request.

In addition, IRIS provides Maximum Contaminant Levels (MCLs) for constituents. MCLs are promulgated under the Safe Drinking Water Act (SDWA) of 1974, as amended in 1986, and consider technology and economic feasibility as well as health effects. Finalized MCLs are used as the delisting levels for carcinogens and systemic toxicants when available. Proposed MCLs are used as delisting levels for carcinogens and systemic toxicants when finalized MCLs are not available.

Some of the constituents on the delisting docket report entitled "Docket Report on Health-Based Levels and Solubilities Used in the Evaluation of Delisting Petitions, Submitted Under 40 CFR §260.20 and §260.22" are not on IRIS. In these cases, other references, such as health and environmental effects documents (HEEDs), Office of Drinking Water (ODW) health advisories, Carcinogen Assessment Group (CAG) profiles, Health Effects Assessment Summary

Tables (HEASTs), and various chemical files are used and will be provided by the Delisting Section upon request. The same equations presented above are used for calculating delisting levels from unverified health-based levels.

HEALTH-BASED LEVELS AND SOLUBILITIES FOR CONSTITUENTS OF CONCERN IN DELISTING PETITIONS

July 1992

CAS No.	Compound	HBL (mg/l)	Ref.	Solubility (mg/l), (in H_2O at 25°C)	Ref.
83 32 9	Acenaphthene	2	4	3.42	6
67 64 1	Acetone	4	4	1.0×10^6	6
75 05 8	Acetonitrile	2×10^{-1}	4	1.0×10^6	6
98 86 2	Acetophenone	4	4	5.5×10^3	15
107 02 8	Acrolein	7×10^{-1}	45	5×10^5	2
79 06 1	Acrylamide	Treatment Technique	42	$>1 \times 10^6$	15
107 13 1	Acrylonitrile	6×10^{-5}	5	7.9×10^4	6
309 00 2	Aldrin	2×10^{-5}	5	1.8×10^{-1}	6
62 53 3	Aniline (Benzeneamine)	6×10^{-3}	5	3.5×10^4	2
7440 36 0	Antimony	6×10^{-3}	27		
140 57 8	Aramite	1×10^{-3}	5		
7440 38 2	Arsenic	5×10^{-2}	13		
7440 39 3	Barium	2	19		
56 55 3	Benz(a)anthracene	1×10^{-4}	43	5.7×10^{-3}	6
71 43 2	Benzene	5×10^{-3}	14	1.75×10^3	6
92 87 5	Benzidine	2×10^{-7}	5	4.0×10^2	6
50 32 8	Benzo(a)pyrene	2×10^{-4}	27	1.2×10^{-3}	6
205 99 2	Benzo(b)fluoranthene	2×10^{-4}	43	1.4×10^{-2}	6
100 51 6	Benzyl alcohol	1×10^1	45	4×10^4 (17°C)	15
100 44 7	Benzyl chloride	2×10^{-4}	5	3.3×10^3	6
7440 41 7	Beryllium	4×10^{-3}	27		
111 44 4	Bis(2-chloroethyl)ether	3×10^{-5}	5	1.02×10^4	6
108 60 1	Bis(2-chloroisopropyl ether)	5×10^{-4}	45	1.7×10^3	6
117 81 7	Bis(2-ethylhexyl)phthalate	6×10^{-3}	27	4×10^{-1}	11
75 27 4	Bromodichloromethane	3×10^{-4}	5	4.7×10^3 (22°C)	22
74 83 9	Bromomethane	5×10^{-2}	4	1.0×10^3	18
85 68 7	Butyl benzyl phthalate	1×10^{-1}	27	2.9	10
88 85 7	2-sec-Butyl-4,6-dinitrophenol (Dinoseb)	7×10^{-3}	27	5×10^1	6
7440 43 9	Cadmium	5×10^{-3}	42		
75 15 0	Carbon disulfide	4	4	2.94×10^3	6
56 23 5	Carbon tetrachloride	5×10^{-3}	14	7.57×10^2	6
57 74 9	Chlordane	2×10^{-3}	42	5.6×10^{-1}	6
106 47 8	p-Chloroaniline	1×10^{-1}	4	3.9×10^3	24
108 90 7	Chlorobenzene	1×10^{-1}	42	4.66×10^2	6
510 15 6	Chlorobenzilate	7×10^{-1}	4	1×10^4	1

**Unverified health-based levels

HEALTH-BASED LEVELS AND SOLUBILITIES FOR CONSTITUENTS OF CONCERN IN DELISTING PETITIONS

July 1992

CAS No.	Compound	HBL (mg/l)	Ref.	Solubility (mg/l)* (in H_2O at 25°C)	Ref.
126 99 8	2-Chloro-1,3-butadiene (Chloroprene)	$7x10^{-1}$	45	$3x10^{2}$	1
124 48 1	Chlorodibromomethane	$4x10^{-4}$	45	$4.4x10^{3}$(22°C)	22
67 66 3	Chloroform	$6x10^{-3}$	5	$8.2x10^{3}$	6
95 57 8	2-Chlorophenol	$2x10^{-1}$	4	$2.85x10^{4}$(20°C)	15
107 05 1	3-Chloropropene (Allyl chloride)	$2x10^{-3}$	36	$1x10^{2}$	15
7440 47 3	Chromium	$1x10^{-1}$	42		
218 01 9	Chrysene	$2x10^{-4}$	43	$1.8x10^{-3}$	6
319 77 3	Cresols	2	4	$3.1x10^{4}$	6
57 12 5	Cyanide	$2x10^{-1}$	27		
94 75 7	2,4-Dichlorophenoxyacetic Acid (2,4-D)	$7x10^{-2}$	42	$8.9x10^{2}$	6
72 54 8	DDD	$1x10^{-4}$	5	$1x10^{-1}$	6
72 55 9	DDE	$1x10^{-4}$	5	$4x10^{-2}$	6
50 29 3	DDT	$1x10^{-4}$	5	$5x10^{-3}$	6
2303 16 4	Diallate	$6x10^{-4}$	45	$1.4x10^{1}$	6
53 70 3	Dibenz(a,h)anthracene	$3x10^{-4}$	43	$5.0x10^{-4}$	6
96 12 8	1,2-Dibromo-3-chloropropane	$2x10^{-4}$	42	$1.0x10^{3}$	6
74 95 3	Dibromomethane	$4x10^{-1}$	45	$1.3x10^{4}$	25
84 74 2	Di-n-butyl phthalate	4	4	$1.3x10^{1}$	6
95 50 1	1,2-Dichlorobenzene	$6x10^{-1}$	42	$1.0x10^{2}$	6
106 46 7	1,4-Dichlorobenzene	$7.5x10^{-2}$	14	$7.9x10^{1}$	6
91 94 1	3,3'-Dichlorobenzidine	$8x10^{-5}$	5	4	6
75 71 8	Dichlorodifluoromethane	7	4	$2.8x10^{2}$	6
75 34 3	1,1-Dichloroethane	4	45	$5.5x10^{3}$	6
107 06 2	1,2-Dichloroethane	$5x10^{-3}$	14	$8.52x10^{3}$	6
75 35 4	1,1-Dichloroethylene	$7x10^{-3}$	14	$2.25x10^{3}$	6
156 59 2	cis-1,2-Dichloroethylene	$7x10^{-2}$	42	$3.5x10^{3}$	6
156 60 5	trans-1,2-Dichloroethylene	$1x10^{-1}$	42	$6.3x10^{3}$	6
75 09 2	Dichloromethane	$5x10^{-3}$	27	$2.0x10^{4}$	6
120 83 2	2,4-Dichlorophenol	$1x10^{-1}$	4	$4.6x10^{3}$	6
78 87 5	1,2-Dichloropropane	$5x10^{-3}$	42	$2.7x10^{3}$	6
542 75 6	1,3-Dichloropropene	$2x10^{-4}$	45	$2.8x10^{3}$	6
60 57 1	Dieldrin	$2x10^{-8}$	5	$1.95x10^{-1}$	6
84 66 2	Diethyl phthalate	$3x10^{1}$	4	$8.96x10^{2}$	6
56 53 1	Diethylstilbesterol	$7x10^{-9}$	45	$1.3x10^{4}$	15
60 51 5	Dimethoate	$7x10^{-3}$	4	$2.5x10^{4}$	6

**Unverified health-based levels

HEALTH-BASED LEVELS AND SOLUBILITIES FOR CONSTITUENTS OF CONCERN IN DELISTING PETITIONS

July 1992

CAS No.	Compound	HBL (mg/l)	Ref.	Solubility (mg/l), (in H_2O at 25°C)	Ref.
119 90 4	3,3'-Dimethoxybenzidine	$3x10^{-3}$	45	$2x10^{3}$	1,23
119 93 7	3,3'-Dimethylbenzidine	$4x10^{-6}$	45	$7x10^{1}$	1,23
57 97 6	7,12-Dimethylbenz(a)-anthracene	$1x10^{-6}$	20	$4.4x10^{-3}$	6
105 67 9	2,4-Dimethylphenol	$7x10^{-1}$	4	$5.9x10^{2}$	9
131 11 3	Dimethyl phthalate	$4x10^{2}$	45	$4.3x10^{3}$	2
99 65 0	1,3-Dinitrobenzene	$4x10^{-3}$	4	$4.7x10^{2}$	6
51 28 5	2,4-Dinitrophenol	$7x10^{-2}$	4	$5.6x10^{3}$	6
121 14 2	Dinitrotoluene	$5x10^{-5}$	5,21	$1.32x10^{3}$	6
117 84 0	Di-n-octyl phthalate	$7x10^{-1}$	45	3	22
123 91 1	1,4-Dioxane	$3x10^{-3}$	5	$4.31x10^{5}$	6
122 39 4	Diphenylamine	$9x10^{-1}$	4	$5.76x10^{1}$	6
122 66 7	1,2-Diphenylhydrazine	$4x10^{-5}$	5	$1.84x10^{3}$	6
298 04 4	Disulfoton	$1x10^{-3}$	4	$2.5x10^{1}$	24
115 29 7	Endosulfan	$2x10^{-3}$	4	$5.3x10^{-1}$	22
72 20 8	Endrin	$2x10^{-3}$	27	$2.5x10^{-1}$	22
106 89 8	Epichlorohydrin (1-Chloro-2,3-epoxypropane)	Treatment Technique	42	$6.0x10^{4}$	6
110 80 5	2-Ethoxy ethanol	$1x10^{1}$	45	$1x10^{5}$	1
100 41 4	Ethyl benzene	$7x10^{-1}$	42	$1.52x10^{2}$	6
60 29 7	Ethyl ether	7	4	$6.05x10^{4}$	12,2
106 93 4	Ethylene dibromide	$5x10^{-5}$	42	$4.3x10^{3}$	6
97 63 2	Ethyl methacrylate	3	45	$7x10^{2}$	1,6
62 50 0	Ethyl methanesulfonate	$1x10^{-6}$	28	$3.69x10^{5}$	6
52 85 7	Famphur	$1x10^{-3}$	41	$1.43x10^{2}$	15
206 44 0	Fluoranthene	1	4	$2.06x10^{-1}$	6
86 73 7	Fluorene	1	4	1.69	6
16984 48 8	Fluoride	4	39		
64 18 6	Formic acid	$7x10^{1}$	45	$1x10^{6}$	6
76 44 8	Heptachlor	$4x10^{-4}$	42	$1.8x10^{-1}$	6
1024 57 3	Heptachlor epoxide (alpha, beta, gamma isomers)	$2x10^{-4}$	42	$3.5x10^{-1}$	6
118 74 1	Hexachlorobenzene	$1x10^{-3}$	27	$6.0x10^{-3}$	6

**Unverified health-based levels

HEALTH-BASED LEVELS AND SOLUBILITIES FOR CONSTITUENTS OF CONCERN IN DELISTING PETITIONS

July 1992

CAS No.	Compound	HBL (mg/l)	Ref.	Solubility (mg/l)* (in H_2O at 25°C)	Ref.
87 68 3	Hexachlorobutadiene	$4x10^{-4}$	5	$1.5x10^{-1}$	6
77 47 4	Hexachlorocyclopentadiene	$5x10^{-2}$	27	2.1	6
67 72 1	Hexachloroethane	$3x10^{-3}$	5	$5.0x10^{1}$	6
70 30 4	Hexachlorophene	$1x10^{-2}$	4	$4x10^{-3}$	6
319 84 6	alpha-HCH	$6x10^{-6}$	5	1.63	6
319 85 7	beta-HCH	$2x10^{-5}$	5	$2.4x10^{-1}$	6
193 39 5	Indeno(1,2,3,cd)pyrene	$4x10^{-4}$	43	$5.3x10^{-4}$	6
78 83 1	Isobutanol	$1x10^{1}$	4	$7.6x10^{4}$	3
78 59 1	Isophorone	$9x10^{-3}$	5	$1.2x10^{4}$	15
143 50 0	Kepone	$2x10^{-6}$	29	7.6 (24°C)	15
7439 92 1	Lead	$1.5x10^{-2}$	44		
58 89 9	Lindane (gamma-HCH)	$2x10^{-4}$	42	7.8	6
7439 97 6	Mercury	$2x10^{-3}$	42		
126 98 7	Methacrylonitrile	$4x10^{-3}$	4	$2.5x10^{4}$	15
67 56 1	Methanol	$2x10^{1}$	4	$>1x10^{6}$	1
72 43 5	Methoxychlor	$4x10^{-2}$	42	$4x10^{-2}$(24°C)	24
74 87 3	Methyl chloride	$3x10^{-3}$	45	$6.5x10^{3}$	6
56 49 3	3-Methylcholanthrene	$1x10^{-6}$	30		
78 93 3	Methyl ethyl ketone	2	45	$2.68x10^{5}$	6
108 10 1	Methyl isobutyl ketone	2	45	$1.91x10^{4}$	2
80 62 6	Methyl methacrylate	3	45	$2.0x10^{1}$	6
298 00 0	Methyl parathion	$9x10^{-3}$	4	$6x10^{1}$	6
91 20 3	Naphthalene	1	45	$3.4x10^{1}$	15
91 59 8	2-Naphthylamine	$4x10^{-5}$	31	$5.86x10^{2}$	6
7440 02 0	Nickel	$1x10^{-1}$	27		
98 95 3	Nitrobenzene	$2x10^{-2}$	4	$1.9x10^{3}$	6
79 46 9	2-Nitropropane	$4x10^{-6}$	26	$1.7x10^{5}$	38
924 16 3	N-Nitroso-di-n-butylamine	$6x10^{-6}$	5	$6.7x10^{3}$	1,23
55 18 5	N-Nitrosodiethylamine	$2x10^{-7}$	5	$4.1x10^{5}$	1,23
62 75 9	N-Nitrosodimethylamine	$7x10^{-7}$	5	$2x10^{2}$	1
156 10 5	N-Nitrosodiphenylamine	$7x10^{-3}$	5	$4.0x10^{1}$	10
621 64 7	N-Nitrosodi-n-propylamine	$5x10^{-6}$	5	$9.9x10^{3}$	1
10595 95 6	N-Nitrosomethylethylamine	$2x10^{-6}$	5	$2x10^{4}$	1
100 75 4	N-Nitrosopiperidine	$8x10^{-6}$	32	$>1x10^{6}$	6
930 55 2	Nitrosopyrrolidine	$2x10^{-5}$	5	$>1x10^{6}$	6

**Unverified health-based levels

HEALTH-BASED LEVELS AND SOLUBILITIES FOR CONSTITUENTS OF CONCERN IN DELISTING PETITIONS

July 1992

CAS No.	Compound	HBL (mg/l)	Ref.	Solubility (mg/l) (in H_2O at 25°C)	Ref.
152 16 9	Octamethyl pyrophosphoramide	$7x10^{-2}$	45	$>1x10^{6}$	1
56 38 2	Parathion	$2x10^{-1}$	45	$2.4x10^{1}$ (20°C)	15
608 93 5	Pentachlorobenzene	$3x10^{-2}$	4	$1.35x10^{-1}$	6
82 68 8	Pentachloronitrobenzene	$1x10^{-4}$	45	$7.11x10^{-2}$	6
87 86 5	Pentachlorophenol	$1x10^{-3}$	19	$1.4x10^{1}$	6
108 95 2	Phenol	$2x10^{1}$	4	$9.3x10^{4}$	6
298 02 2	Phorate	$7x10^{-3}$	40	$5x10^{1}$	18
1336 36 3	Polychlorinated biphenyls	$5x10^{-4}$	42	$3.1x10^{-2}$	6
23950 58 5	Pronamide	3	4	$1x10^{2}$	1
129 00 0	Pyrene	1	4	$1.32x10^{-1}$	6
110 86 1	Pyridine	$4x10^{-2}$	4	$4x10^{4}$	11
94 59 7	Safrole	$1x10^{-4}$	33	$1.5x10^{3}$	6
7782 49 2	Selenium	$5x10^{-2}$	42		
7440 22 4	Silver	$2x10^{-1}$	4		
57 24 9	Strychnine and salts	$1x10^{-2}$	4	$1.56x10^{2}$	6
100 42 5	Styrene	$1x10^{-1}$	42	$3x10^{2}$	15
95 94 3	1,2,4,5-Tetrachlorobenzene	$1x10^{-2}$	4	6	6
630 20 6	1,1,1,2-Tetrachloroethane	$1x10^{-3}$	5	$2.9x10^{3}$	6
79 34 5	1,1,2,2-Tetrachloroethane	$2x10^{-4}$	5	$2.9x10^{3}$	6
127 18 4	Tetrachloroethylene	$5x10^{-3}$	42	$1.5x10^{2}$	6
58 90 2	2,3,4,6-Tetrachlorophenol	1	4	$1x10^{3}$	6
3689 24 5	Tetraethyl dithiopyro-phosphate	$2x10^{-2}$	4	$3x10^{1}$	25
7440 28 0	Thallium	$2x10^{-3}$	27		
108 88 3	Toluene	1	42	$5.35x10^{2}$	6
95 80 7	Toluene-2,4-diamine	$1x10^{-5}$	45	$4.77x10^{4}$	6
823 40 5	Toluene-2,6-diamine	7	45	$1.3x10^{5}$	1
95 53 4	o-Toluidine	$1x10^{-4}$	45	$7x10^{2}$	1,23
106 49 0	p-Toluidine	$2x10^{-4}$	45	$7.4x10^{3}$ (21°C)	15
8001 35 2	Toxaphene	$3x10^{-3}$	42	$5x10^{-1}$	6
93 72 1	2,4,5-TP (Silvex)	$5x10^{-2}$	42	$1.4x10^{2}$	2
75 25 2	Tribromomethane (Bromoform)	$4x10^{-3}$	5	$3.01x10^{3}$	6
120 82 1	1,2,4-Trichlorobenzene	$7x10^{-2}$	27	$3.0x10^{1}$	6
71 55 6	1,1,1-Trichloroethane	$2x10^{-1}$	14	$1.5x10^{3}$	6
79 00 5	1,1,2-Trichloroethane	$5x10^{-3}$	27	$4.5x10^{3}$	6
79 01 6	Trichloroethylene	$5x10^{-3}$	14	$1.1x10^{3}$	6

**Unverified health-based levels

HEALTH-BASED LEVELS AND SOLUBILITIES FOR CONSTITUENTS OF CONCERN IN DELISTING PETITIONS

July 1992

CAS No.	Compound	HBL (mg/l)	Ref.	Solubility (mg/l)' (in H_2O at 25°C)	Ref.
75 69 4	Trichlorofluoromethane	$1x10^{1}$	4	$1.1x10^{3}$	6
95 95 4	2,4,5-Trichlorophenol	4	4	$1.19x10^{3}$	6
88 06 2	2,4,6-Trichlorophenol	$3x10^{-3}$	5	$8.0x10^{2}$	6
93 76 5	2,4,5-Trichlorophenoxy-acetic acid (2,4,5-T)	$4x10^{-1}$	4	$2.4x10^{2}$(30°C)	2
96 18 4	1,2,3-Trichloropropane	$2x10^{-1}$	4	$4x10^{3}$	1
76 13 1	1,1,2-Trichloro-1,2,2-trifluoroethane	$1x10^{3}$	4	$1x10^{1}$	6
99 35 4	sym-Trinitrobenzene	$2x10^{-3}$	4	$3.5x10^{2}$	2
126 72 7	Tris(2,3-dibromopropyl) phosphate	$3x10^{-5}$	35	$1.2x10^{2}$	6
7440 62 2	Vanadium	$2x10^{-1}$	45		
75 01 4	Vinyl chloride	$2x10^{-3}$	14	$2.67x10^{3}$	6
1330 20 7	Xylene (mixed)	$1x10^{1}$	42	$1.98x10^{2}$	6
7440 66 6	Zinc	7	45		

**Unverified health-based levels

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United States Environmental Protection Agency | Solid Waste and Emergency Response (OS-305) | EPA/530-F-93-005 Spring 1993

Office of Solid Waste

EPA

Environmental Fact Sheet

Delisting Petitions and the Petition Review Process

Introduction

What is delisting?

Delisting is a rulemaking procedure by which facilities, if successful, are relieved of the obligation to handle specific wastes as hazardous in accordance with the Resource Conservation and Recovery Act (RCRA). EPA defined these wastes as hazardous by listing them in the Code of Federal Regulations (40 CFR §261, Subpart D). In some cases, however, a specific facility might generate a waste that does not exhibit any hazardous characteristics for which the waste was listed and does not present a hazard to either human health or the environment for any other reason. Therefore, to avoid placing an unnecessary regulatory burden on such facilities, RCRA regulations provide a petition process for case-by-case exclusions or "delistings" of specific wastes from the hazardous waste lists.

How does a facility obtain a delisting?

Under 40 CFR § 260.20 and 260.22, facilities may petition EPA to delist (or exclude) a specific waste from the hazardous waste regulations. The general procedures for delisting a hazardous waste are described in a guidance manual (see adjacent box). A delisting generally applies to only the specific waste generated at the facility and does not apply to wastes from any other facility. Under RCRA, states authorized to administer a delisting program in lieu of the federal program also may exclude wastes from hazardous waste regulations. Facilities that manage their wastes in states with delisting authorization should petition the state for an exclusion rather than EPA. Even in unauthorized states, EPA encourages petitioners to contact state authorities to determine what procedures might be necessary for delisting under state laws. A facility may treat its waste as nonhazardous only after EPA or an authorized state grants a final exclusion.

What are the different types of exclusions?

A *standard exclusion*, requiring no conditional testing, is granted when a petition demonstrates that the waste meets the delisting criteria and that variability of the waste is not of concern. A *conditional exclusion* is granted when the waste being generated is expected to be highly variable in composition. Such exclusions typically establish delisting levels for key waste constituents and require the facility to test the waste periodically to ensure the waste remains nonhazardous. An *upfront exclusion* is a special form of conditional exclusion granted for a waste that is not yet generated. In this type of exclusion the petitioner demonstrates that the waste will meet the delisting criteria based on preliminary treatability studies (e.g., pilot plant data). For upfront exclusions, the petitioner typically performs extensive verification testing once the full-scale process is operational to ensure delisting levels are obtained.

An Overview of the Petition Review Process

Draft sampling and analysis plans

EPA encourages facilities to contact EPA's Office of Solid Waste

Guidance Manual

A step-by-step manual is available to assist petitioners in preparing and submitting a delisting petition. The manual is entitled *Petitions to Delist Hazardous Waste: A Guidance Manual*, EPA/530-R-93-007. Copies of the manual are available through the National Technical Information Service (703-487-4650), as publication number PB 93-169 365.

For further information on submitting a delisting petition or draft sampling and analysis plan to EPA, contact the Delisting Section, Office of Solid Waste, at 202-260-4770/6946 or at the address below:

U.S. Environmental Protection Agency
Delisting Section
Office of Solid Waste
(Mail Code OS-333)
401 M Street, SW.
Washington, DC 20460

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(CSW) for assistance in their petition efforts before submitting a formal petition. In order to minimize repetitive EPA requests for information and review of incomplete information, petitioners should submit draft sampling and analysis plans prior to waste characterization efforts. Early discussions with OSW about the nature and extent of information that should be included in a petition also are useful.

Successful Petitions

The majority of excluded wastes are metal-bearing wastes (such as F006 and F019 wastewater treatment sludges and treated K061 electric arc furnace dusts). Historically, only 15 to 20 percent of submitted delisting petitions have been granted. However, any treatment residual that meets current BDAT levels usually will be a good delisting candidate.

Petition review process

EPA's review process for delisting petitions consists of the following major steps: (1) a completeness check and a request for additional information needed, (2) a technical evaluation of the waste analysis and process data, (3) a proposal of a decision in the *Federal Register*, and (4) a review of public comments and promulgation of a final decision. If a petition is incomplete, EPA will request further information. EPA typically will dismiss petitions from further review if a petitioner does not provide a complete petition. A petitioner may submit a new petition after collecting the missing information. Once EPA has evaluated a complete petition, it proposes a decision to grant or deny the petition. EPA must publish proposed decisions in the *Federal Register* and invite public comments before granting or denying the petition. The final notice contains EPA's response to public comments, the final decision, and regulatory language amending 40 CFR §261, Appendix IX, for delisted wastes. Because delisting is a rulemaking process, it typically takes about two years for a formal petition to make it through EPA's review process and for a final rule to be published in the *Federal Register*. EPA usually reviews delisting petitions in chronological order based on the date of receipt. Therefore, if a backlog of petitions develops, some delistings decisions might be delayed. Recently, however, EPA has been successful in significantly reducing the backlog.

Petition Information Requirements

The petitioner's guidance manual noted earlier provides details on the information needed for delisting and assists interested facilities in submitting a credible and complete petition. Generally, a complete petition includes the following information:

- A detailed description of the manufacturing and treatment processes generating the petitioned waste and the volume of waste generated.
- A discussion of why the waste is listed as hazardous and a description of how the waste is managed.
- A discussion of why samples collected in support of the demonstration are thought to represent the full range of variability of the petitioned waste.
- Results from the analyses of a minimum of four representative samples of the petitioned waste for:
  - Applicable hazardous waste characteristics (ignitability, corrosivity, or reactivity).
  - Total and leachable concentrations of all hazardous constituents likely to be present in the petitioned waste. For example, the constituents listed in the Toxicity Characteristic (TC) typically are among the constituents required (see 40 CFR §261.24).
  - Total oil and grease content.
- Chain-of-custody records and quality control (QC) data for all analytical data. Appropriate QC procedures are described fully in Chapters 1 and 4 and in each test method of EPA publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (Third Edition)*. Analyses are expected to conform to the standards of SW-846.
- A statement signed by an authorized representative of the facility certifying that all information is accurate and complete.
- Ground-water monitoring information, if the petitioned waste has been disposed of in a land-based hazardous waste management unit. Ground-water monitoring data might not be required in some cases, therefore the petitioner should consult the guidance manual and EPA if unsure. The petitioner may resubmit data already collected in response to existing RCRA regulations or cite existing reports submitted to EPA that provide the necessary data.

See the guidance manual for a more detailed description of what information EPA usually requires and the appropriate sampling and analysis procedures.

Technical Review

EPA's use of modeling tools

EPA often evaluates the potential hazards of waste through the use of appropriate fate and transport models. These models calculate possible exposure to hazardous chemicals that might be released from petitioned wastes after disposal, based on a reasonable, worst-case management scenario. A key exposure route of concern is

ingestion of contaminated ground water. To evaluate this concern, the Agency typically relies on leachate data as determined by an appropriate leaching test (e.g., the Toxicity Characteristic Leaching Procedure [TCLP] used in the TC; see 40 CFR 261.24). The leachable concentrations and the estimated waste volume then are used as inputs to an appropriate fate and transport model, for example, EPA's Composite Model for Landfills (EPACML), to predict the constituent concentrations in the ground water at a hypothetical exposure point. The output of this model, the dilution/attenuation factor (DAF), represents the reduction in contaminant concentration expected to occur during transport through soil and ground water, from the leachate release point (bottom of the landfill) to an exposure point (receptor well). The DAF is calculated by dividing the contaminant concentration in the leachate leaving the landfill by the concentration at the receptor well. Exposure-point concentrations derived from the DAFs typically are compared to drinking water standards or other EPA health-based levels. The leachate from small waste volumes undergoes greater dilution/attenuation than leachate from larger waste volumes, because larger volumes release greater amounts of leachate into the ground water. Table 1 provides a listing of some of the DAFs generated using the EPACML for annual waste volumes ranging from 1,000 to 300,000 cubic yards per year. As an example of how the DAFs in Table 1 are used in the delisting process, EPA would use a DAF of 15 from Table 1 for 100,000 cubic yards of waste generated annually and the health-based level in Table 2 for arsenic (0.05 ppm) to calculate a delisting level for this constituent in the TCLP test of 0.75 ppm (e.g., 15 x 0.05 ppm). (See the *Federal Register* notice published on July 18, 1991, 56 *FR* 32993,

Table 1. EPACML DAFs

Waste Volume (cubic yards/yr)	Dilution Attenuation Factor (DAF)
1,000	100
1,500	90
2,000	79
4,000	57
6,000	48
8,000	43
10,000	36
25,000	24
50,000	19
100,000	15
200,000	13
300,000	12

Table 2. Health-Based Levels for Selected Hazardous Constituents

Compounds	HBL (ppm)
Arsenic	0.05
Barium	2
Benzene	0.005
Benzo(a)pyrene	0.0002
Bis(2-ethylhexyl)phthalate	0.006
Cadmium	0.005
Carbon Tetrachloride	0.005
Chlorobenzene	0.1
Chromium	0.1
Cyanide	0.2
1,2-Dibromo-3-chloropropane	0.0002
1,4-Dichlorobenzene	0.075
1,2-Dichloroethane	0.005
1,2-Dichloropropane	0.005
1,1-Dichloroethylene	0.007
Ethylbenzene	0.7
Hexachlorobenzene	0.001
Lead	0.015
Mercury	0.002
Nickel	0.1
PCBs	0.0005
Pentachlorophenol	0.001
Selenium	0.05
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
1,2,4-Trichlorobenzene	0.07
1,1,1-Trichloroethane	0.2
Trichloroethylene	0.005
Vinyl chloride	0.002
Xylenes	10

for more details on the use of the FPACML in delisting evaluations.)

Health-based levels

The health-based levels used by EPA in delisting decision-making are updated periodically in order to stay consistent with the latest drinking water standards (e.g., Maximum Contaminant Levels, or MCLs), risk information, and toxicological data. Table 2 gives some delisting health-based levels currently used by OSW for selected constituents. An up-to-date list of health-based levels of the constituents of concern is normally contained in the RCRA public docket for the latest delisting rulemakings. The list is available from OSW upon request. Also, a large number of EPA-verified health-based levels are available through EPA's Integrated Risk Information System (IRIS). (For more information on accessing IRIS, contact the IRIS User Support Group at 513-569-7254.)

Agency's evaluation of ground-water monitoring data

As noted above, petitions to exclude wastes contained in land-based waste management units should include ground-water monitoring information relevant to the unit(s) in which the petitioned waste is managed. If the data indicate that the waste in question has caused ground-water contamination, EPA may deny the petition. How EPA may use ground-water monitoring data in delisting is described in a *Federal Register* notice (October 12, 1989; 54 FR 41930).

Spot-check program

EPA may conduct announced or unannounced spot-checks at some facilities in order to verify the petition information and data submitted and to generate analytical data of its own to resolve ambiguities in the petitioner's data. A spot-check visit to a selected facility may be initiated before finalizing a petition decision or after granting an exclusion.

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